In item 6 on page 3 of the Office action, claims 1 and 7-9 have been rejected as being anticipated by *Summerfelt et al.* (US 5,566,045) under 35 U.S.C. § 102.

In paragraph 2 on page 4 of the Office action, claims 1, 3-5 [3, 5] and 7-12 have been rejected as being anticipated by *Kawakubo et al.* (US 5,691,219) under 35 U.S.C. § 102.

The Examiner states on page 2 of the Office action that "Summerfelt et al. disclose … a GaP layer … which is a compound of a transition element (Ga)". It is respectfully pointed out to the Examiner that Gallium is a group IIIb element and, therefore, is not a transitional element. Enclosed is a copy of the periodic table copied from the ENCYCLOPAEDIA BRITANNICA where Gallium is marked in red. Hence, claims 1 and 7-9 are not anticipated by *Summerfelt et al.*.

Regarding the discussion in the last response, Counsel acknowledges that Counsel misread the symbol TL (Thallium) on the periodic table for the symbol TI (Titanium).

The Examiner states on page 3 of the Office action "Kawakubo et al. does not explicitly teach that the barrier is a compound of a transitional element and phosphorous. It is

compound of a transitional element and phosphorous. It is inherent that the transitional metal layer (12) will react with phosphorous from the connection structure to form a barrier material such as a TiP or TiP [sic]. Therefore, it is inherent that Kawakubo et al.'s device including a barrier of TaP or TiP. See reference US 6015997 col. 7 lines 55-60 which was cited to support the inherence". US 6,015,997, states at col. 7, lines 55-60, that "[c]ertain Group VB nonmetal elements, such as: N, P, As, and Sb, can react with titanium to form barrier materials". However, the reference US 6,015,997 does not show that the amount of phosphorous present in a silicon layer due to doping is sufficient to create a (complete) barrier layer of TiP. In US 6,015,997, TiP is used to form a matrix (and not TiP barrier layer), yet, additional phosphorous atoms are implemented even through present in the silicon layer below the matrix. It has been the experience of the Applicant that the concentration of phosphorous atoms used as a dopant for a plug is ***far too low*** to create a TiP barrier layer.

Hence, it is believed that it is not inherent that the transitional metal layer will react with phosphorous ***from the connection structure*** to form a barrier layer. Therefore, claims 1, 3-5 [3, 5] and 7-12 are not anticipated by *Kawakubo et al.*

Furthermore, it is also believed that such a barrier layer as recited in claim 1 is non-obvious over the cited references since none of the cited references gives any suggestion to form or use such a barrier layer as recited in claim 1.

It is accordingly believed to be clear that neither *Summerfelt et al.* nor *Kawakubo et al.* show the features of claim 1. Also it is believed that neither *Summerfelt et al.* nor *Kawakubo et al.* suggest the features of claim 1. Claim 1 is, therefore, believed to be patentable over the art and since claims 1, 3, 5 and 7-12 are ultimately dependent on claim 1, they are believed to be patentable as well.

In view of the foregoing, reconsideration and allowance of claims 1, 3, 5 and 7-12 are solicited.

Please charge any fees which might be due with respect to Sections 1.16 and 1.17 to the Deposit Account of Lerner and Greenberg, P.A., No. 12-1099.

Respectfully submitted,

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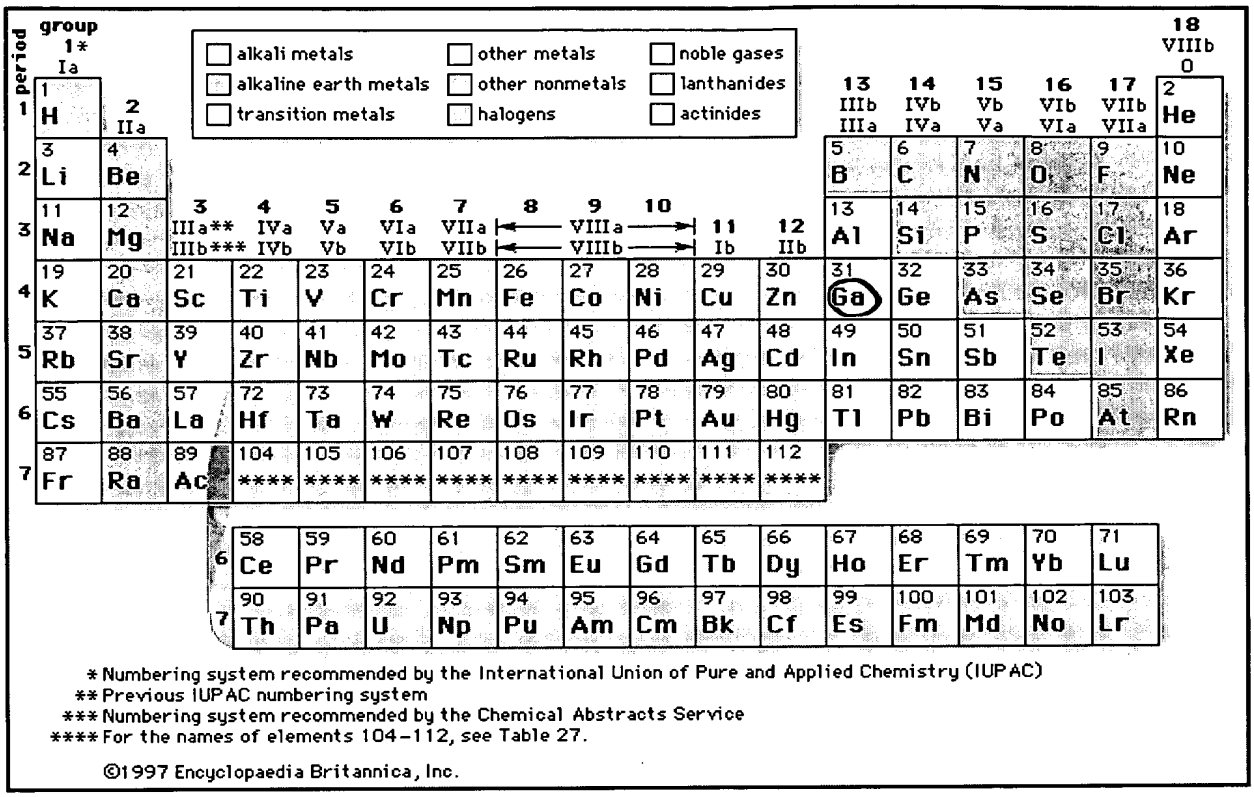

Figure 1: Modern version of the periodic table of the elements. To see more information about an element, select one from the table.
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